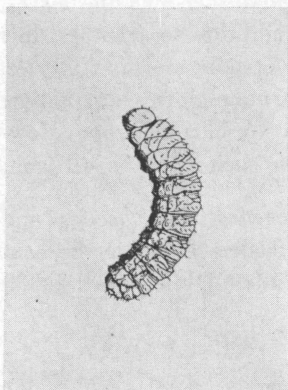
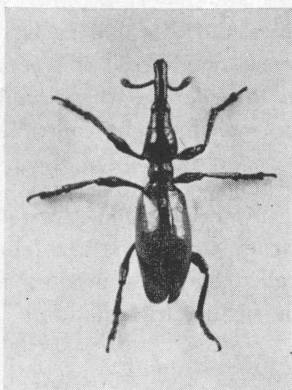


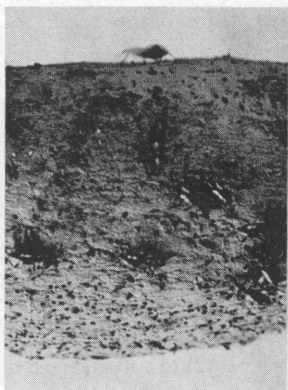
Ways to Control the Weevil *and* Diseases of Sweetpotatoes



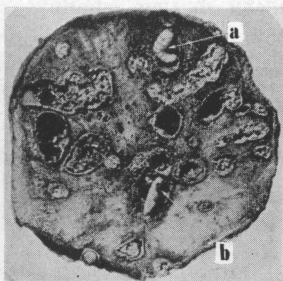
Larva of Sweetpotato Weevil



Adult Sweetpotato Weevil



Weevil Damaged Sweetpotato



**Cross Section of Sweetpotato
Showing a. Larva and
b. Pupa of Sweetpotato Weevil**

INSECTS

The sweetpotato weevil is the most destructive insect enemy of the sweetpotato crop in Texas. The pest is widely distributed over the southern part of the State while the northern area is relatively free of the pest. (See map.)

The potatoes may be honeycombed by the feeding of the grubs. These grubs are legless, white, with yellowish-brown heads, about $\frac{1}{4}$ inch in length. Infested potatoes taste bitter, making them unfit for food.

The adult snout beetles are $\frac{1}{4}$ inch long with an ant-like appearance. The head and wing covers are blue-black while the middle region of the body and legs are reddish-brown. The adults feed on the leaves, vines, potatoes and roots. In addition to potatoes, this insect may breed in roots of certain morning glories. In those areas where wild morning glories are native, the weevil can be controlled in the current crop. However, eradication of the pest in such areas is difficult.

Minor insects: *Tortoise beetles*, *flea beetles* and *garden webworms* are foliage feeders and may be controlled by spray or dust containing DDT. (See C-323 for further information.)

DISEASES

Black rot is a destructive disease in the seedbed, field and in storage. Infection occurs through the roots resulting in firm, shallow, circular brown spots. As the spots enlarge, they become greenish-black to black. Diseased potatoes taste bitter, making them unfit for food.

Stem rot (wilt) invades the roots and grows rapidly into the vascular tissues of the stems. The first symptom of stem rot in the field is the appearance of a dull green and yellowing between veins of the leaves. Wilting of the vines soon occurs, followed by blackening of the entire plant and eventual death. When an infected sweetpotato is examined in cross section, a blackened ring is visible. Infection occurs in the seedbed or in the field from infested soil or diseased seed stock.

Soil rot (pox), caused by a soil inhabiting organism, persists in the soil from one season to another. Diseased

plants are dwarfed with small, pale green leaves and few vines. Decayed spots occur on the small roots and potatoes, which at harvest are misshapen with conspicuous pits. There is no effective control for soil rot. Crop rotation may be of some value.

The root knot nematode causes small knots or swellings on the roots of infected plants and surface of infected potatoes. Infection occurs through infested soil or diseased seed stock. In fields heavily infested with nematodes, the sweetpotato plants may be stunted severely and their yield reduced greatly. Crop rotation and soil fumigation are the only feasible methods of control. Soil fumigation is practical only on a small scale, such as treating seedbeds.

Internal cork, a virus disease, causes hard, dark brown to black, corky areas in the potato flesh. Leaf symptoms may appear first as mottled and chlorotic areas along the veins. Later these areas develop purplish margins (rings). Little is known regarding control of this disease. Obtain certified seed potatoes for slip production.

Soft rot is a storage disease. Infection occurs through wounds or bruises. Diseased potatoes are soft and watery and are covered with "whiskers" (fungus) growth. Later the potatoes become shriveled, hard and brittle.

Surface rot infection occurs when sweetpotatoes are being dug, or early in the storage period. The symptoms appear as shallow, circular spots. Later the entire potato becomes shrunken, dry and hard.

Charcoal rot is characterized by tiny, black spherical bodies inside the sweetpotato. The sweetpotatoes soon become shrunken, hard and dry, having a charcoal-like appearance.

CONTROL

Quarantines are maintained to prevent the spread of insects and diseases and to assist in their eradication and control. The following recommended practices will result in eradicating or reducing weevil infestations and diseases:

1. Rotation of the crop is essential and sweetpotatoes should not be planted within a mile of a known weevil

infestation or in soil previously infected with diseases. Grow sweetpotatoes on land only one year out of five.

2. Bed only certified seed potatoes or set only certified slips. *If certified seed cannot be used*, disinfect seed potatoes by immersing them in a corrosive sublimate solution (1 ounce in 8 gallons of water) for 10 minutes. Use wooden containers. Add $\frac{1}{2}$ ounce of corrosive sublimate dissolved in hot water to each 24 gallons of solution after each 10 bushels of potatoes are treated. After treating 30 bushels, renew solution entirely. Spergon, borax and Semesan may be substituted for corrosive sublimate solution. Follow the manufacturer's directions. To control internal cork disease, obtain certified slips or seed potatoes. Examine for internal cork symptoms by cutting several potatoes into thin slices. If internal cork symptoms are found, discard entire lot of seed potatoes.

3. Harvest only in dry weather and allow sweetpotatoes to dry in field. Destroy the old seedbed as soon as plants have been set in the field. All potatoes must be removed at harvest and vines, crowns and roots destroyed as soon as possible by grazing and plowing. Fields should be plowed at least twice during the winter. Store only weevil-free and disease-free potatoes.

4. All storage places should be cleaned, disinfected and sprayed with 10 percent DDT before storing potatoes. Disinfectants recommended for disease prevention are: (1) Apply commercial formaldehyde, 1 pint in 15 gallons of water to interior of storage house as a spray or with a broom. Grates and baskets may be dipped; (2) Apply bichloride of mercury, $\frac{1}{4}$ ounce in 8 gallons of water, as recommended for formaldehyde; (3) fumigate with a mixture of 23 ounces of potassium permanganate and 3 pints of commercial formaldehyde for each 1,000 cubic feet of storage space. Keep storage place closed for 24 hours and *ventilate thoroughly before entering*.

5. Sweetpotatoes store better in crates than in bins or piles. If decay develops, do not remove diseased potatoes until all are to be marketed.

6. Cure 4 days at 85 degrees F. and 95 percent relative humidity; store at 55 degrees F. and 80 percent relative humidity.

7. Seed potatoes should be dusted thoroughly with 10 percent DDT at the rate of 1 pound to 8 bushels.

DDT-treated potatoes must not be used for food unless washed thoroughly.

Promising control of the sweetpotato weevil in the seedbed and field: The use of insecticides has proved successful for control of the sweetpotato weevil in seedbeds and field plantings in preliminary tests. Sufficient research has not been conducted, however, to warrant the recommendation of insecticides for weevil control under field conditions. Nevertheless, growers who are in need of a chemical control in the seedbed and field may follow on a trial basis the following methods.

Seedbed treatment: Use 25 pounds of 2 percent dieldrin dust per acre or $\frac{1}{4}$ pound of dust to each 100 feet of row. Make first application when first plants emerge, second when all plants have emerged and third after plants have been pulled, provided a second growth of plants is to be used.

Field treatments: Use 50 pounds of 2 percent dieldrin per acre or $\frac{1}{2}$ pound of dust per 100 feet of row. Make first application when runners from adjacent rows meet and second when potatoes mature and soil begins to crack. Apply the dust at the base of the plants.

Caution: Insecticides and fungicides are poisons and precautions given on the labels should be followed strictly.

REGULATORY REQUIREMENTS

Regulated areas: Other states and certain areas within this State have regulations on the movement of seed or table sweetpotatoes and sweetpotato slips. Contact local inspectors or county agents for information on these regulations.

Eradication area: The counties of Angelina, Anderson, Houston, Nacogdoches, San Augustine, Trinity, Leon and any other county in which an official sweetpotato weevil eradication area may be hereinafter instigated under the authority of the Texas Pest Control Law.

Restricted material: (1) Sweetpotato roots or tubers, plants, vines or parts thereof, (2) any vines or roots of other plants belonging to the genus *Ipomoea* and (3) such other plants as may be found to be hosts of the sweetpotato weevil.

Conditions governing movement of restricted material: Restricted material shall not be moved from any regulated area into, within, or from the State of Texas unless a valid sweetpotato weevil inspection certificate (as described in the succeeding paragraph) issued by a duly authorized inspector is securely attached to the outside of each container thereof.

Conditions governing the issuance of certificate tags for movement of restricted material from the regulated and eradication areas: A certificate for the movement of restricted material from any regulated area in the State of Texas to points outside thereof will be issued by a duly authorized inspector upon determination that (1) the material certified apparently free from infestation of the sweetpotato weevil, and (2) that the material has been produced, packed, and handled for shipment under such conditions as to eliminate any danger of spread of weevils provided that no certificate will be issued for the shipment of sweetpotatoes from Texas to any state which may prohibit such entry of potatoes from the area defined; provided, however, that sweetpotatoes for eating purposes may be moved within the regulated area of the State of Texas without special permit.

Rules and regulations governing the bedding, production and distribution of sweetpotatoes and slips in the official sweetpotato weevil eradication areas of Texas:

(1) Permit for bedding sweetpotatoes—It shall be unlawful to bed sweetpotatoes on any farm or within one mile of any field found infested with the sweetpotato weevil within the past 12 months, for the purpose of the production of plants, vines, cuttings, slips or draws in any county of this State in which an "Official Sweetpotato Weevil Eradication Area" has been established under the laws of this State without first registering with and receiving from the Commissioner of Agriculture or his duly authorized agent a permit to conduct such an operation in line with the official program.

(2) Source of planting stock—Owners of properties within the eradication areas shall secure bedding potatoes, plants, vines and cuttings only from sources and under conditions approved by the State Quarantine Official.

(3) Sale of sweetpotato plants—Persons shall not offer for sale, give or distribute slips, vines, cuttings,

draws or any part thereof when produced within the regulated area unless articles 1 and 2 of this proclamation have been complied with.

(4) Location of field on which sweetpotatoes are grown—Sweetpotato vines, plants, or parts thereof shall not be planted within one mile of an infestation which has been found within 12 months.

(5) All sweetpotatoes grown on an infested property in the eradication area shall be harvested before November 15 of the year of production, and owner shall thoroughly clean the fields at the time of harvest, removing all sweetpotatoes, and parts thereof, and disposing of same to the satisfaction of the inspector.

(6) Location and condition of storage places on infested properties shall be approved by the inspector in charge before the sweetpotato crop is harvested.

(7) All sweetpotatoes remaining in storage within one mile of an infestation after February 1 of the year following production must be dusted with 10 percent DDT. Storage facilities shall be cleaned at this time to the satisfaction of the inspector. (DDT-treated potatoes must not be used for food unless washed thoroughly.)

It is hereby declared that these regulations shall be cumulative with the regulations originally prescribed for regulatory procedure in the production and handling of sweetpotatoes and sweetpotato propagation material in the following quarantine proclamations issued previously by the Commissioner of Agriculture.

Angelina County, Quarantine Proclamation No. 57-C, Dated October 7, 1938; Nacogdoches County, Quarantine Proclamation No. 57-D, Dated October 8, 1938; San Augustine County, Quarantine Proclamation No. 57-D, Dated August 30, 1938; Houston County, Quarantine Proclamation No. 92-H, Dated February 1, 1949; Trinity County, Quarantine Proclamation No. 92-E, Dated September 15, 1943; Leon County, Quarantine Proclamation No. 92-V, Dated February 1, 1954.

Requirements for shipment into Texas of sweetpotatoes from the regulated areas of other states: Those desiring to ship sweetpotatoes from the regulated area of other states into the weevil area of Texas must make

application for permit, giving the number of their home state permit, and furnish bond in the amount of \$1,000.00 for reimbursing any purchasers for any sweetpotatoes that may be destroyed or returned to shipper for irregularities or failure to abide by regulations. Tags must be printed bearing text of permit and permit number. A shipping permit is obtained for each load from state inspectors, and a copy of each permit is mailed to the East Texas office for checking. Each load must be checked in at the Quarantine Station at the bridge in Orange, Texas, for inspection and admission to Texas. Each container must be tagged and also be stamped with the words SOUTH TEXAS ONLY.

Requirements for shipment of sweetpotatoes within the regulated areas of Texas: Sweetpotatoes are not to be moved from an infested property unless special permission is received from the Quarantine Officials.

Potatoes, seed or slips will not be allowed to move out of the county except by special permit.

All storage houses and their surrounding premises, within the infested area shall be completely cleaned of all potato material and sprayed with 10 percent DDT before May 1.

Volunteer vines and plants from potatoes and roots left in the ground after harvesting must be destroyed for they furnish the food for the weevil to live on until the next season. The inspector will advise how this is to be done and will lend assistance.

All of this work shall be under the direction of the inspector in charge.

Potatoes will be allowed to move to the northern markets, and to the infested area of Texas, however, they must be accompanied by a permit issued by a State Inspector.

Sweetpotatoes, seed sweetpotatoes and sweetpotato slips, vines, cuttings or morning glory vines, shall not be shipped or transported from one place to another, sold or offered for sale in this State except when each container of sweetpotatoes, or bundle of plants, shall have attached a tag bearing a copy of certificate issued by the Commissioner of Agriculture and found apparently free from any dangerous disease or insect.

Seed potatoes or sweetpotato plants may not be sold except State Certified Seed Sweetpotatoes and State Certified Sweetpotato Plants.

Certification of Seed Sweetpotatoes and Sweetpotato Plants

(1) Two inspections of sweetpotatoes while growing in the field must be made at intervals of not less than 30 days nor more than 45 days apart. Seed will not be certified from field showing any of the following diseases or insects:

Disease: Stem wilt or rot, black rot, pox, nematode (rootknot) and internal cork.

Sweetpotato weevil:

(2) All seed potatoes must be smooth, free from breaks, cracks, crooks, bruises, decayed spots, and disease signs, insect pest damage or signs. They must be at least 1½ inches in diameter and at least 3 inches in length. Over five percent of toleration will not be allowed for oval or round shaped potatoes.

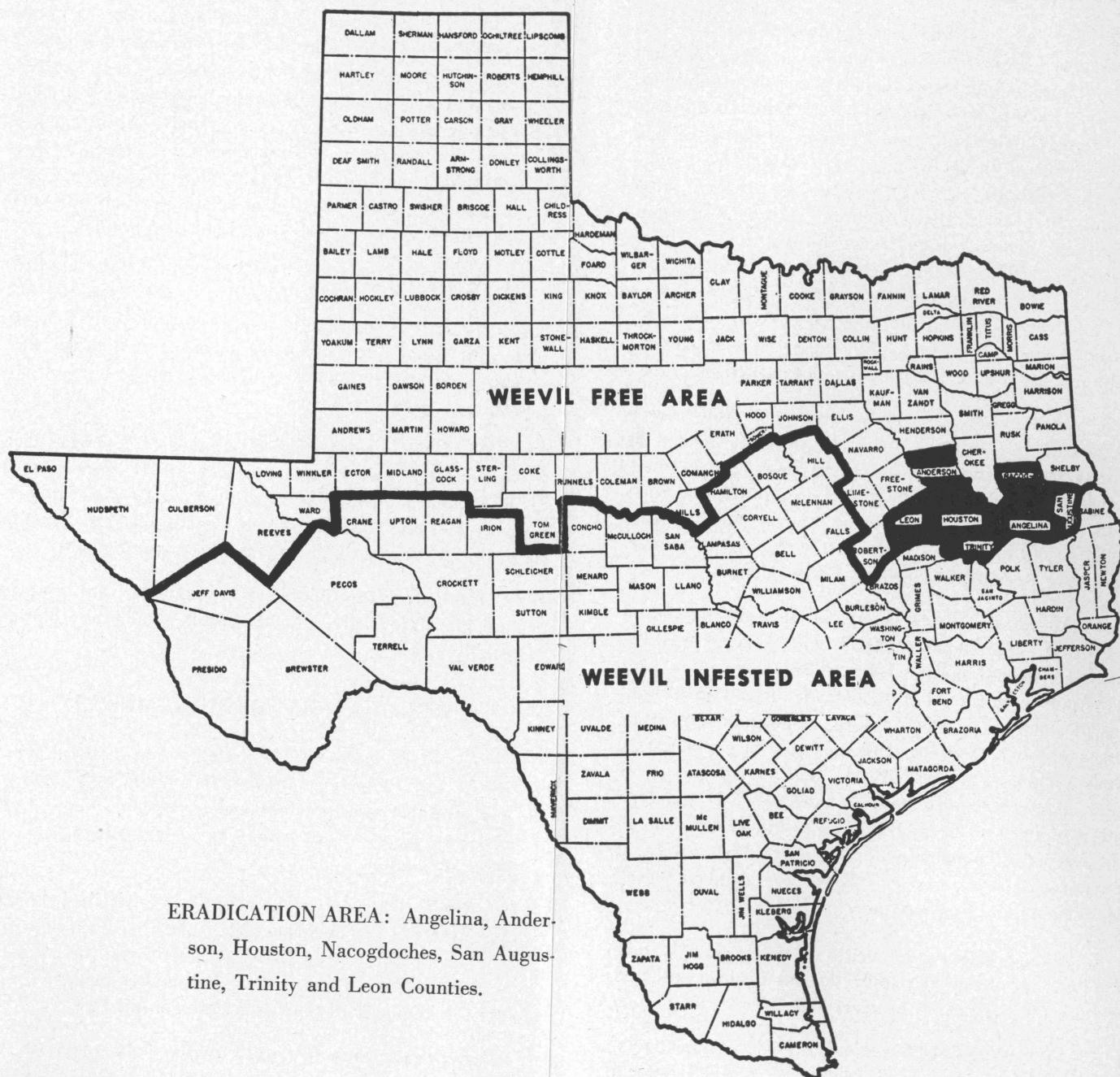
(3) Only seed sweetpotatoes grown within the sweetpotato weevil-free area are eligible for certification.

(4) Seed sweetpotatoes offered for sale or transportation shall be packed in containers, crates, sacks, baskets, or boxes, and a certificate of certification shall be held by the owner as evidence of certification.

(5) First field inspections will be made from June 1 to July 15; later inspections do not allow enough time for the second inspection before harvest.

Seed for bedding must qualify as certified seed, except a seedbed inspection will be made at bedding time instead of a storage inspection. Seed sweetpotatoes shall not be bedded on ground that has been used for potato growing or bedding, and shall be at least three hundred (300) feet from such area, and no boards, straw, fertilizer, or other substance that have been used in connection with storage houses or beds shall be used about such potato beds. Barnyard manure shall not be used as fertilizer in the fields or beds. At the seedbed inspection a qualified inspector will (a) pass upon the suitability of the seed after they are graded, (b) supervise the dipping of the seed in a standard solution of Corrosive Sublimate for 10 minutes, or a solution of Semesan Bel (one

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pound of Semesan Bel to 7½ gallons of water) for 10 minutes in a solution of Borax (6 pounds of Borax to 30 gallons of water), (c) test the solution periodically to insure proper strength and (d) advise the grower as to subsequent handling.

Field, storage, and seedbeds are subject to inspection at any and all times by an inspector of the Texas Department of Agriculture, and certification will be annulled if disease or weevils are found, or if the rules and regulations have not been complied with.

Each bundle of 100 certified slips exposed for sale or shipment must have attached a serially numbered label issued under the control of the Texas Department of Agriculture.

Application for certification of seed sweetpotatoes and sweetpotato plants shall be made prior to harvesting the preceding season. *The fee to be paid at the time field inspection is made shall be* five dollars (\$5.00) and for acreage of more than five (5) acres, the added fee of fifty (50¢) cents per acre shall be paid. All Plants lifted for sale shall be packaged in bundles of one hundred (100) plants and a label shall be affixed to each bundle. A charge of one cent (1¢) per label will be made for each label issued.

ACKNOWLEDGMENT

The recommendations in this circular are based upon results of experiments conducted by the Texas Agricultural Experiment Station and other research agencies. The information on regulatory requirements is from the Texas Department of Agriculture.

For additional information, contact your county agent, local sweetpotato inspector or write the extension entomologist, College Station, Texas.